

DOC, NOAA Employees Help D.C. Kids Read

—Maria Krug

President Clinton has challenged communities, colleges, government and private institutions and individual citizens across the country to help ensure that every child can read well and independently by the end of the third grade.

In response to this challenge, the Commerce Department established a pilot program for all DOC employees working in the H.C. Hoover Building in Washington, D.C., to serve as tutors in the D.C. Reads This Summer Program, helping increase literacy among children in primary grades in schools of greatest need in the nation's capital

Sixty DOC employees, including a half dozen NOAA employees, answered the President's call, serving as reading tutors in a pilot program at Webb Elementary School this past summer.

The volunteers were allotted time during the work day to participate in tutoring activities. Volunteer tutors worked on a "buddy system." One individual tutored the student on Tuesdays, another on Thursdays.

All volunteer tutors received training during an orientation session in early July, with no previous teaching experience necessary to participate in the program.

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Employees answer the President's call to help



Iris Harris/DOC

Sixty DOC and NOAA employees in the H.C. Hoover Building took up President Clinton's challenge to help ensure that every child in America can read well and independently by the end of the third grade by tutoring these students from Webb Elementary School in Washington, D.C.

Divers Find Monitor Wreck Collapsing

—Dane Konop

The first modern warship, *USS Monitor*, rests serenely on the sea floor in a field of shipwrecks known as the "Graveyard of the Atlantic." While the historic *Monitor* wreck is protected from salvagers and curiosity seekers in the nation's first national marine sanctuary, the ship is not shielded from the ravages of Mother Nature.

Divers returned to *Monitor* in August to find that the sunken ship's iron-plated hull, armor belt, engine room and revolutionary revolving gun turret are continuing to rust away in the turbulent

waters 16 miles off Cape Hatteras, N.C., with the historic wreck on the verge of total collapse.

The ship lies upside down partly submerged in the bottom silt,

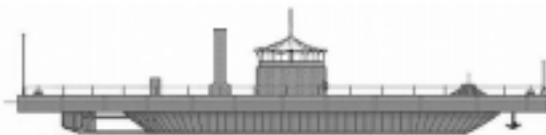
precari-
ously
supported
by its
towering,
120-ton
gun turret.

Even so, the ship's distinctive turret and the heavily corroded iron-clad hull are still recognizable.

The situation is dire, but the wreck has not yet totally succumbed to Mother Nature, and recovery of key parts of the warship

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Illustration: Scale drawing of *USS Monitor*.
Jeff Johnston/NOAA



NOAA Survey Teams Finds

The Monument Measures Up a Bit Taller



Andrew Hurley/Leica for NOAA

NOAA geodetic technician Roy Anderson pauses in front of the Washington Monument following a trip to the monument's apex to measure its height.

Everyone knows the Washington Monument is tall, mandated by law to be the tallest building in the District of Columbia. But exactly how tall is it?

To answer that monumental question, geodesists and geodetic technicians from NOAA's National Geodetic Survey measured the famous obelisk during the week of August 16 using the Global Positioning System and a suite of sophisticated surveying instruments.

Preliminary results of the NOAA survey indicate the monument is 555 feet, 5 and 9/10 inches tall, slightly taller but within an inch of its traditionally listed height of 555 feet, 5 and 1/8 inches, according to National Geodetic Survey director Charles W. Challstrom.

"We think this is the elevation from the original floor," said survey technician Roy Anderson.

Although a U.S. Coast and Geodetic Survey team had surveyed the monument's exact latitude and longitude in 1934, its height had never been determined this precisely, Challstrom said.

Engineers will also use the new data to monitor the stability of the monument, currently wrapped in an aluminum scaffolding for renovation by the National Park Service, to determine any otherwise imperceptible shifting or settling.

Over a three-day period beginning Aug. 16, NOAA survey team members took thousands of GPS measurements from the monument's apex and on the ground using a high-accuracy, geodetic-quality GPS instrument.

Every 15 seconds the surveyors received signals from at least five GPS satellites at a time for extremely precise measurements.

To get to the top, technicians rode a temporary exterior elevator, then climbed a 60-foot ladder to secure the survey gear at the monument's apex. "It's an awesome experience to touch the top of the monument," said National Geodetic Survey deputy director David Zilkoski.

"It's a feat that only a few people will ever experience. I'm proud to be involved with this important work and consider it a privilege to participate in the project," Zilkoski said. ☺

Employee Tutors

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The department also made arrangements to transport tutors to and from the school.

Linda Trageser, DOC coordinator for the program, is very enthusiastic about the department's participation. "The response from DOC employees has been overwhelming," she said.

The program was so successful, it may be extended and rolled out to DOC agencies outside the Washington, D.C., area.

"The tutoring sessions were productive because Linda was so organized. We could concentrate on instruction rather than transportation and other logistics," said Rosanne Greene of NOAA's budget office in the Hoover Building.

"I think this program is successful because people are tired of 'talk, talk, talk.' We actually got to help people," Greene said.

On the first day, as the tutors filed into the classroom, the students' shyness gave way to smiles as the tutors were paired with the children and given time to get acquainted.

All tutors followed a preset curriculum established by D.C. Reads, which consists of icebreaker exercises, time for the children to select books to read, a "picture walk" of the book before the reading session, a "buddy reading" of the book between the children and their tutors and time for children to write in their journals at the conclusion of the session.

Can two hours a week really help children develop a love for reading that will last them a lifetime? Just ask Tyree Reeves, who wrote in his journal, "Today was a GREAT day! I learned to sound out words. I never did that before. I learned to pronounce words I didn't know. I can read better than I ever thought I could. I had a GREAT time!" ☺

Historic Monitor Rusting Away

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is still possible, according to *Monitor* sanctuary manager John Broadwater.

"The turret seems to be holding up fairly well and the engine is still attached to its base," said Broadwater, who is a marine archaeologist. He oversaw the dives from a University of North Carolina at Wilmington research vessel, *Cape Fear*, positioned above the wreck.

"The engine room supports have all bent and allowed the lower hull to deform and settle. Some of the weight seems to be taken up by the deck that it's pressing into," Broadwater said.

"The engine is still attached to the original engine mounts, indicating there hasn't been a serious collapse in the past year that could have caused the engine to pull loose, drop down and be damaged. It seems to have somewhat gently settled down, indicating that there might still be a chance of recovering the engine intact," he said.

"We see something different every year," Broadwater said. "In the last five or six years there has been a noticeable change in the hull. This year, for instance, we've seen more stanchions that have bent as the hull settles further.

"We've seen more hull plating that's disappeared, either collapsed or disintegrated," he said.

"We've seen a new hole open up in the armor belt that we haven't seen before. We'll continue to document that and try to make predictions on when we might see a more serious collapse.

"We'll also make recommendations on any additional shoring that might help prevent that sort of thing," Broadwater said.



John Chluski/Cambrian Foundation for NOAA
Flipping over as it sank on December 31, 1862, *Monitor's* hull came to rest on its distinctive cylindrical gun turret, as seen in this photo from the August 1999 expedition. Two emergency air cylinders can be seen in the right of the photo.

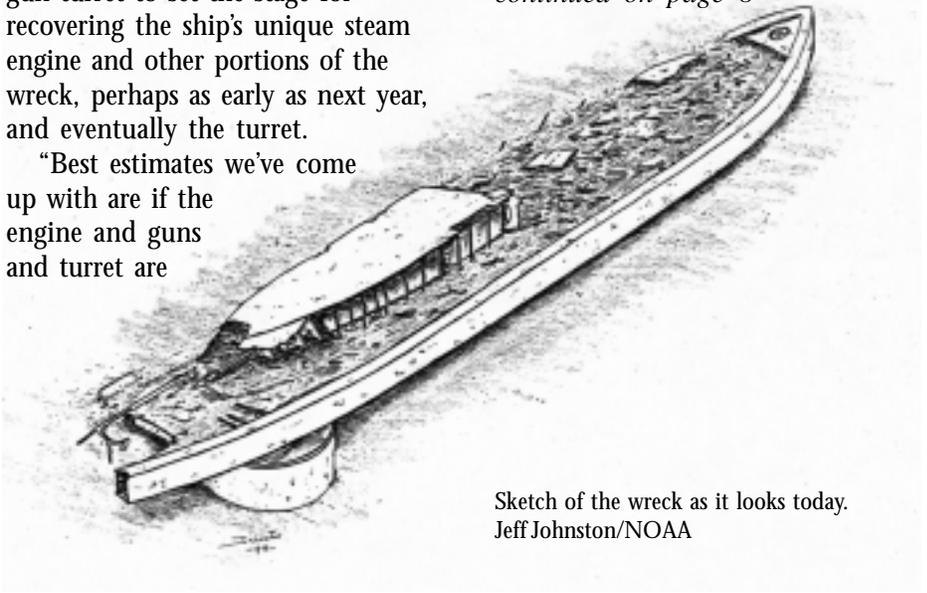
Daily dives revealed a wreck on the verge of collapsing

From August 10-25, a dozen divers from the NOAA Diving Center, the National Undersea Research Center at the University of North Carolina at Wilmington, and the Cambrian Foundation made daily dives on the wreck. The divers photographed the ship's armor belt and engine compartment and excavated around the now submerged top of the ship's gun turret to set the stage for recovering the ship's unique steam engine and other portions of the wreck, perhaps as early as next year, and eventually the turret.

"Best estimates we've come up with are if the engine and guns and turret are

all recovered and the remaining hull is stabilized with cement bags, it all could be done for \$12 million," Broadwater estimated. "Once you got all that historical material up, it probably would take another \$10 million to do the conservation and stabilization of the recovered objects."

Artifacts would be conserved and displayed at the Mariners' Museum *continued on page 8*



Sketch of the wreck as it looks today.
Jeff Johnston/NOAA

Focus**On...**

Tropical

The arrival of Hurricanes

Dora, Brett and Dennis in August added momentum to what had been called a slowly starting hurricane season. NOAA forecasters remind coastal residents that the peak period for tropical cyclones in the Northeast and Northwest Pacific is late August and early September and early to mid-September in the Atlantic basin.

A storm full of surprises

While scientists have made great strides in predicting and tracking the path of hurricanes, Dennis vividly illustrated that these enigmatic storms can still surprise us. NOAA researchers in August examined whether warm pools of surface water in the Gulf of Mexico cause some hurricanes to intensify rapidly. Here are some other little known details about the storms we call “tropical cyclones.”

A super storm, by any name

Tropical cyclones are called “hurricanes” if wind speeds exceed 73 miles per hour and they occur in the Atlantic Ocean and east of the International Dateline in the Pacific Ocean. They are called “typhoons” in the Indian Ocean and in the Pacific Ocean west of the dateline.

Where do tropical cyclones come from?

About 60 percent of Atlantic tropical storms and minor hurricanes originate from wavelike disturbances in the atmosphere over Africa. Nearly all tropical cyclones in the Eastern Pacific Ocean can be traced back to Africa.

Source: Christopher Landsea,
NOAA's Hurricane Research Division.
Image: Hurricane Dora as seen from
GOES 10, Aug. 10, 1999.

Cyclones

The costliest tropical storms

Hurricane Andrew in 1992 caused a record \$26.5 billion in damages in the Bahamas, Florida and Louisiana. If inflation, coastal county population changes and other statistical factors such as changes in wealth are considered, the unnamed hurricane that struck southeast Florida and Alabama in 1926 was the costliest, at over \$80 billion in 1998 dollars.

Record stormy years

The stormiest year in the Northwest Pacific was 1964, with 39 tropical storms, 26 of which became typhoons. In the Northeast Pacific, there were a record 27 tropical storms and hurricanes. For the Atlantic, 1933 holds the record, with 21 tropical storms and hurricanes.

East Coast versus West Coast

On average, less than two hurricanes a year make landfall on the U.S. Atlantic and Gulf of Mexico coasts. No hurricanes have ever been recorded to have hit the U.S. Pacific coast, although on rare occasions the west coast has been visited by weakened tropical storms. This is because hurricanes tend to move west-northwest after they form, a track that takes them away from the west coast. Plus, Pacific coastal waters are too cool to provide much energy to feed the storms.

Stronger, more frequent tropical cyclones ahead?

There is scant evidence that hurricanes, typhoons and tropical cyclones are getting stronger or becoming more frequent over the very long term. The years 1991-94 produced the fewest hurricanes on record, with an average of less than four a year. There is evidence that tropical storm activity may run in multi-decade cycles and that more frequent tropical storms since 1995 mark a return of another active period that may last for the next 25 to 40 years.

For more scientific information about tropical cyclones, go to <http://www.aoml.noaa.gov/hrd/tcfaq/tcfaqA.html> or <http://hurricanes.noaa.gov>.

Jump-starting a Reef's Restoration

—Lisa Symons

A 4,000-year-old reef in the Florida Keys that was crushed in a vessel grounding in 1994 was given a head start to recovery through a state-of-the-art coral reef restoration, completed August 22.

During the restoration, limestone boulders ranging from three to five tons were bound together with a combination of composite fiberglass and an inert underwater concrete mix. Divers applied layers of the material until each site was brought up to grade with the surrounding spur.

The divers also placed smaller pieces of coral rubble and limestone from the initial grounding on top, minimizing the concrete surface.

This design allowed for a closer approximation of typical coral spur topography and enhances the opportunities for benthic recolonization of the repair surface.

NOAA's Florida Keys National Marine Sanctuary Resource Manager Harold Hudson transplanted several coral colonies directly onto the repair site.

These included colonies of *Siderastrea sidera*, *Montastraea faveolata* and *Montastraea cavernosa*. Later transplants will include other colonies of the major resident benthic species previously present at the site—hard corals, soft corals, sponges and sea mat. Algal growth on the site has already encouraged a number of small herbivorous fish to return to the reef.

The site will be continually monitored to assess the reef's recovery and gauge the return of benthic species like corals and sponges, as well as fish.

The *R/V Columbus Iselin*, a 155-foot research vessel owned by the University of Miami, went aground in Looe Key National Marine Sanctuary, now part of the Florida Keys National Marine Sanctuary,

just before midnight on August 10, 1994. The vessel remained on the reef for 38 hours, causing extensive damage to four spurs of the reef and creating significant debris in the surrounding area. The grounding destroyed 345 square meters of living coral and 338 square meters of the reef framework, killing or displacing large numbers of hard corals, sea fans, sponges, fish and other marine creatures.

The University of Miami settled with NOAA for \$3.76 million in natural resource damage claims for the grounding, including a \$200,000 civil penalty. The settlement included funds for physical and biological restoration and monitoring of the grounding site, as well as compensatory restoration, monitoring and grounding prevention elsewhere in the sanctuary.

While the case was being settled, the reef was further damaged by Hurricanes Georges and Mitch and by the "Groundhog Day Storm" in 1998. ☹



Jerry Britton/NOAA

A diver from construction contractor Team Land Development, Inc., spreads a special fiberglass and marine concrete mix between boulders to restore a reef in the Florida Keys.

Supporting NATO in Serbia



Larry E. Freeman, Jr./USAF

Air Force weather director Brig. Gen. Fred Lewis (left) presented NOAA Administrator D. James Baker with a plaque Aug. 5 recognizing the contributions NOAA employees made to the successful conclusion of the NATO air campaign in Serbia during the recent conflict. Lewis noted that, on short notice, NOAA extended short-range global aviation model runs, provided innovative ensemble forecasts for the Balkans area of operations and found unique ways to obtain and process timely meteorological data for the Balkans.

Commerce-wide Aquaculture Policy Unveiled at Forum

—Matthew Borgia

“We in Commerce can be the agency of sustainable development. Nowhere is that better defined than through aquaculture.” With this opening statement, David Festa, senior advisor to Commerce Secretary William M. Daley, captured the essence of the Department of Commerce National Aquaculture Workshop held in August in Silver Spring, Md.

The workshop, convened by the DOC Aquaculture Task Force, addressed high-priority concerns for fostering future aquaculture development in the U.S. by the intergovernmental Joint Subcommittee on Aquaculture. DOC defines aquaculture broadly to mean the propagation of aquatic animals and plants for any purpose, including food and non-food uses and stock enhancement.

Over 140 experts attended the August 11-13 invitational event held in various sites at NOAA's Silver Spring Metro Center complex. They represented various federal, state and local government entities, fishery and aquaculture industries, and academic and non-profit groups.

Participants were charged with helping prioritize the department's agenda for promoting economically and environmentally sound aquaculture and with identifying areas where greater collaboration between the stakeholders can occur.

The workshop marks the task force's first year and a half of work, which culminated in the development of a formal policy for the department. The task force is chaired by NOAA's Office of Sustainable Development and

Hams honor NOAA meteorologist



James LaDue/NOAA

Dennis McCarthy (center), meteorologist in charge of the Weather Service Forecast Office in Norman, Okla., receives a certificate of merit from James Haynie (right) and Coy Day of the American Radio Relay League, recognizing his ongoing work with amateur radio operators in Oklahoma, including his contributions to saving lives and property during the May 3 tornado outbreak in Oklahoma.

Intergovernmental Affairs, with representatives from several Commerce bureaus. The task force was created to lead the development of aquaculture policy and programs for NOAA, and to achieve greater coordination of aquaculture-related activities among the various department bureaus.

Officially signed by Secretary Daley on August 10, the policy sets forth the mission “to create sustainable economic opportunities in aquaculture in a manner that is environmentally sound,” in essence bringing the combined resources and efforts of all the department's offices to bear on the “sustainable development” of aquaculture.

Several keynote speakers elaborated on and defined this goal. Andrew Rosenberg, National Marine Fisheries Service deputy assistant administrator, said the aquaculture mission complements and is an integral part of the effort to restore and maintain sustainable wild stock fisheries in order to

maximize the benefits of U.S. coastal resources for its citizens. This is part and parcel of several of NOAA's strategic goals, he said.

Both Festa and Roan Conrad, director of NOAA's Office of Sustainable Development and Intergovernmental Affairs, detailed how aquaculture in the U.S. can make major contributions to the local, regional and national economies by providing employment in a new and diverse industry and by creating business opportunities both here and abroad.

They pointed to the opportunities for the U.S. to contribute globally to aquaculture through the development and marketing of environmentally sound technologies and products, and by promoting high international standards. The nation can lead the world in the development of aquaculture technologies and be the promoter of international guidelines for the industry to maintain a healthy environment, participants said. ☺

NOAA's Huxley Rows for Silver in Pan Am Games



Mike Hogan

Olwen Huxley (right) and rowing partner Karin Hughes won a silver medal in the women's heavyweight double sculls at the recent XIII Pan American Games in Winnipeg, Manitoba, finishing 1.4 seconds behind first-place Canada. Huxley, a program analyst for the Office of Oceanic and Atmospheric Research in Silver Spring, Md., and Hughes, the Naval Academy women's rowing coach, are favorites for the U.S. Olympic trials coming next spring.

Monitor

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in Newport News, Va., which has worked in partnership with NOAA since 1987 to curate and conserve the *Monitor* collection. This includes all photos, video, film and scientific data generated by NOAA during on-site research, plus all artifacts recovered from the sanctuary.

During the August dives, "The main objective was to assess the engine room and machinery spaces in general because the next step will be to find a way to recover the engine," Broadwater said. "We looked specifically at how the engine fitted into the mountings and whether the mountings were still intact, whether the framing that held the engine in place was still more or less intact."

The *Monitor* wreck lies on a flat, slightly sloping, relatively shallow submerged plain called "Diamond Shoals." But the area's also called the "Graveyard of the Atlantic," and for good reason. Generations of mariners have gone down with their ships there.

Coastal engineers describe these waters as "highly dynamic." Because the cape juts out into the Atlantic like an elbow, hurricanes

and other storms also regularly run aground on this wind-swept stretch of coast. Below the surface, the shoals and sandbars are constantly shifting, as conflicting currents battle for dominance.

The cobalt-blue waters of the Gulf Stream often meander through the *Monitor* site, and can frequently be seen at the surface edging the contrary grey-green waters of the Labrador Current.

Water clarity is often virtually nil on the shoals. But at other times, the currents align, dropping their load of sand and silt. Underwater visibility can improve to nearly 100 feet during these rare periods. From the air, hundreds of wrecks can be seen littering the sea floor in the shallows.

But it's not just the weather and its offshore location that make a dive on *Monitor* so difficult. The wreck lies 240 feet below the surface, out of view of the general public and far beyond the skill level of most scuba divers.

Terrence N. Tysall, one of the *Monitor* divers and president of the Cambrian Foundation, said "you would have to be a world-class diver" to dive on *Monitor*.

Beyond the potential dangers, on research dives such as those on *Monitor*, Tysall said, "you not only have to do the diving, and do it effectively, but you also have to do research while you're down there and bring back data," he said.

The 250-member Cambrian Foundation is a five-year-old, member-based nonprofit group of mostly divers, based in Winter Park, Fla., dedicated to "research, education, preservation and exploration of the aquatic realm," Tysall said.

"The *Monitor* is a pet project," admitted Tysall, who had dived on *Monitor* long before he founded the Cambrian Foundation. Over the past few years, Tysall trained NOAA and National Undersea Research Center divers, teaching them how to make safe deep dives.

"The current is murderous" at the *Monitor* site, Tysall said. "The wreck is being bombarded by the underwater equivalent of a sandstorm all the time." Unless steps are taken to recover parts of the wreck, "all these little pieces of history are going to be just lost. It's an iron ship. It's in salt water. It's going away," Tysall said simply.

"We can either choose to save and preserve some of the *Monitor* so we can learn about it, and marvel at it, or we can just let it rust into oblivion," he said. ☺

The NOAA Report is a monthly publication for NOAA employees from the Office of Public and Constituent Affairs, Washington, D.C.

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